

**Claims:**

Claim 65 (original):

A method for continuous drawing of fibers, comprising:

- (a) feeding the fiber at an inlet speed to an apparatus for fiber drawing,
- (b) providing the fiber drawing apparatus which comprises a conveyer-drawing structure comprising at least two conveyer-drawing members for conveying and simultaneous drawing of the fiber,
- (c) providing the conveyer-drawing members which:
  - (1) disposed about a central axis which is parallel to a direction of conveying,
  - (2) have receiving ends for receiving the fiber and delivery ends for delivering the fiber, and both the receiving ends and the delivery ends are supported and spaced along the central axis,
  - (3) positioned at a divergence angle  $\alpha$  to the central axis in such a way that the delivery ends are spaced further from the central axis than the receiving ends,
- (d) laying the fiber continuously into coiled loops on the receiving ends of the conveyer-drawing members,
- (e) drawing the fiber at the draw speed by expanding a circumference of the fiber loops while conveying the fiber loops along the central axis from the receiving ends to the delivery ends by the conveyer-drawing members, a layer comprising the coiled fiber loops being formed on the conveyer-drawing members, and
- (f) conveying the drawn fiber from the fiber drawing apparatus at an outlet speed  $V_{outlet}$  wherein a ratio of fiber outlet speed  $V_{outlet}$  to a fiber speed  $(V_{fiber})_{max}$  is substantially greater than 1 to 1, fiber speed  $(V_{fiber})_{max}$  being the highest value of a linear speed of fiber points along the fiber axis in the process of drawing.

Claim 66 (currently amended):

The method of claim 67 65, providing the fiber drawing apparatus which:

- (a) further comprises a fiber feed means for feeding the fiber to the drawing apparatus wherein the feed means comprises a fiber-winding flyer rotating about the central axis and

winding laying continuously the incoming fiber into coiled loops on the receiving ends of the conveyer-drawing members, and

(b) further comprises a fiber take-off means for taking off the leading fiber loops from the delivery ends of the conveyer-drawing members wherein the take-off means comprises a fiber-unwinding flyer rotating about the central axis and unwinding and taking off continuously the leading fiber loops from the delivery ends of the conveyer-drawing members.

Claim 67 (currently amended):

The method of claim 67 65, providing the conveyer-drawing members, which are rotating spindles having fiber displacing members facilitating conveying and simultaneous drawing of the fiber, wherein the displacing members are selected from the group consisting of threads and spiral grooves, and wherein the rotating spindles slowly rotate the fiber loops about the central axis, contact points between the fiber and the spindles being not permanent.

Claim 68 (currently amended):

The method of claim 67 65, providing the conveyer-drawing members, which are selected from the group consisting of circulating endless chains, cables, belts, bands, cords, and escalator-type moving stairs having a plurality of fiber displacing members facilitating the conveying and simultaneous drawing of the fibers.

Claim 69 (currently amended):

The method of claim 70 68, providing the displacing members, which are free to rotate rollers with circular grooves, wherein the fiber is placed in the grooves of the rollers such that the rollers support the coiled fiber loops.

Claim 70 (currently amended):

The method of claim 71 69, providing the rollers, which are driven about their axes, the fiber loops being slowly rotated about the central axis by the rotating rollers, and contact points between the fiber and the rollers being not permanent.

Claim 71 (currently amended):

The method of claim 70 68, providing the displacing members, which are selected from the group consisting of semi-rings, plates, rods, and pins.

Claim 72 (currently amended):

The method of claim 67 65, providing the drawing apparatus, which further comprises a means for adjusting the fiber draw ratio, the means being selected from the group consisting of (a) a means for adjusting the distance between the receiving ends and the central axis, (b) a means for changing a position along the central axis where the fiber is received on the conveyer-drawing members, (c) a means for adjusting the distance between the delivery ends and the central axis, and (d) a means for changing a position along the central axis where the fiber is taken off from the conveyer-drawing members.

Claim 73 (currently amended):

The method of claim 67 65, further including heating the fiber using a heat chamber while the fiber being conveyed and drawn, wherein the heat chamber is supplied with a heat medium selected from the group consisting of hot air, hot inert gas, and superheated steam.

Claim 74 (currently amended):

The method of claim 67 65, further including heating the fiber using a heater while the fiber being conveyed and drawn, wherein the heater is selected from the group consisting of hot plates and baths of an active media.

Claim 75 (original):

An apparatus for continuous drawing of fibers, comprising:

(a) a conveyer-drawing structure comprising at least two conveyer-drawing members for conveying and simultaneous drawing of the fiber,  
wherein the conveyer-drawing members are disposed about a central axis, which is parallel to a direction of conveying,

wherein the conveyer-drawing members have receiving ends for receiving the fiber and delivery ends for delivering the fiber, and both the receiving ends and the delivery ends are supported and spaced along the central axis,

wherein the conveyer-drawing members are positioned at a divergence angle  $\alpha$  to the central axis in such a way that the delivery ends of the conveyer-drawing members are spaced further from the central axis than the receiving ends,

wherein the conveyer-drawing members draw the fiber in the form of coiled loops at a draw speed by expanding a circumference of the fiber loops while conveying the fiber loops along the central axis from the receiving ends to the delivery ends, a layer comprising the coiled fiber loops being formed on the conveyer-drawing members,

(b) a feed means for laying the fiber continuously into the coiled loops on the receiving ends of the conveyer-drawing members,

(c) a take-off means for taking off continuously the leading fiber loops from the delivery ends of the conveyer-drawing members and conveying the drawn fiber from the fiber drawing apparatus at an outlet speed  $V_{outlet}$ , and

wherein the fiber drawing apparatus is constructed and arranged to provide a ratio of fiber outlet speed  $V_{outlet}$  to a fiber speed  $(V_{fiber})_{max}$  substantially greater than 1 to 1, fiber speed  $(V_{fiber})_{max}$  being the highest value of a linear speed of fiber points along the fiber axis in the process of drawing,

**Claim 76 (currently amended):**

The apparatus of claim 77 75, further comprises wherein:

(a) ~~a fiber feed means for feeding the fiber to the drawing apparatus wherein~~ the feed means comprises a fiber-winding flyer rotating about the central axis and ~~winding laying~~ continuously the incoming fiber into coiled loops on the receiving ends of the conveyer-drawing members, and

(b) ~~a fiber take off means for taking off the leading fiber loops from the delivery ends of the conveyer drawing members wherein~~ the take-off means comprises a fiber-unwinding flyer rotating about the central axis and ~~unwinding~~ and taking off continuously the leading fiber loops from the delivery ends of the conveyer-drawing members[[],].

~~wherein the conveyer drawing structure is stationary.~~

Claim 77 (currently amended):

The apparatus of claim 77 75 wherein the conveyer-drawing members are rotating spindles having a fiber displacing members facilitating the conveying and simultaneous drawing of the fiber in the form of coiled fiber loops, wherein the displacing members are selected from the group consisting of threads and spiral grooves, and wherein the rotating spindles slowly rotate the fiber loops about the central axis, contact points between the fiber and the spindles being not permanent.

Claim 78 (currently amended):

The apparatus of claim 77 75 wherein the conveyer-drawing members are selected from the group consisting of circulating endless chains, cables, belts, bands, cords, and escalator-type moving stairs having a plurality of fiber displacing members facilitating the conveying and simultaneous drawing of the fibers.

Claim 79 (currently amended):

The apparatus of claim 80 78 wherein the displacing members are ~~free-to-rotate~~ rollers with circular grooves, wherein the fiber is placed in the grooves of the rollers such that the rollers support the coiled fiber loops.

Claim 80 (currently amended):

The apparatus of claim 81 79 wherein the rollers are driven about their axes, the coiled fiber loops being slowly rotated about the central axis by the rotating rollers, and contact points between the fiber and the rollers being not permanent.

Claim 81 (currently amended):

The apparatus of claim 80 78 wherein the displacing members are guide members selected from the group consisting of semi-rings, plates, rods, and pins.

Claim 82 (currently amended):

The drawing apparatus of claim 77 75, further comprising a means for adjusting the fiber draw ratio selected from the group consisting of (a) a means for adjusting the distance between the receiving ends and the central axis, (b) a means for changing a position along the central axis where the fiber is received on the conveyer-drawing members, (c) a means for adjusting the distance between the delivery ends and the central axis, and (d) a means for changing a position along the central axis where the fiber is taken off from the conveyer-drawing members..

Claim 83 (currently amended):

The apparatus of claim 77 75, further comprising a heat chamber for heating the fiber while it being conveyed and drawn, wherein the heat chamber is supplied with a heat medium selected from the group consisting of hot air, hot inert gas, and superheated steam

Claim 84 (currently amended):

The apparatus of claim 77 75, further comprising a heater for heating the fiber while it is being conveyed and drawn, wherein the heater is selected from the group consisting of hot plates and baths of an active media.

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**b) In Conclusion the Examiner noted that** the drawings and abstract submitted on July 13, 2004 have not been entered (in applicant' response submitted on August 23, 2004), and should be resubmitted by applicants.

Applicants respectfully resubmit complete set of the drawings and the abstract. The abstract has been amended to maintain better consistency with the specification and claims. The amendments are minor and do not introduce new matter.

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